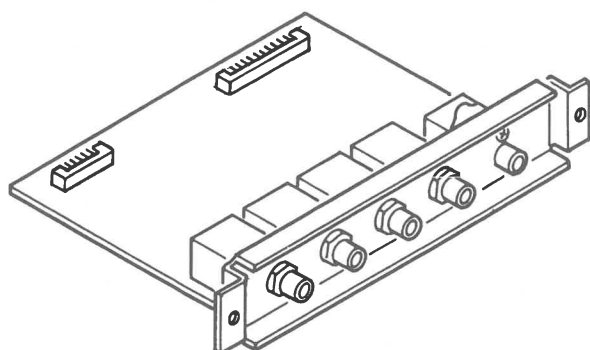


Service Manual

OUTPUT EXPANSION BOARD

SY-ES1



(M), (MC), (XM), (EN), (EH), (EF), (EZ), (EW), (EA),
(EP), (EK), (XL), (XR), (XS), (XD), (XT), (X), (XP)

AREAS

(M): U.S.A.	(EK): the United Kingdom
(MC): Canada	(XL): New Zealand
(XM): Mexico	(XR): Australia
(EN): Norway, Sweden, Denmark, Finland	(XS): Malaysia
(EH): Holland, Belgium	(XD): Saudi Arabia, Hong Kong, Kuwait
(EF): France, Italy	(XT): Taiwan
(EZ): Germany	(X): Thailand, Indonesia, Iran, U.A.E., Panama, Argentina, Peru, Brasil
(EW): Switzerland	(XP): Philippines
(EA): Austria	
(EP): Spain, Portugal, Greece, Singapore, South Africa	

⚠ WARNING

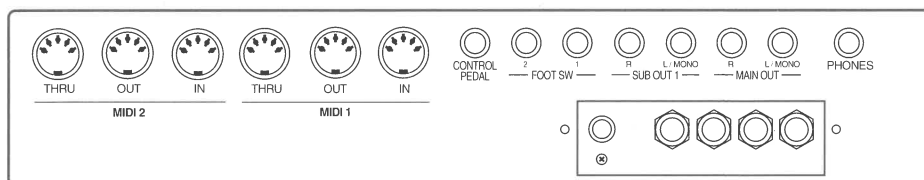
This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

CONTENTS

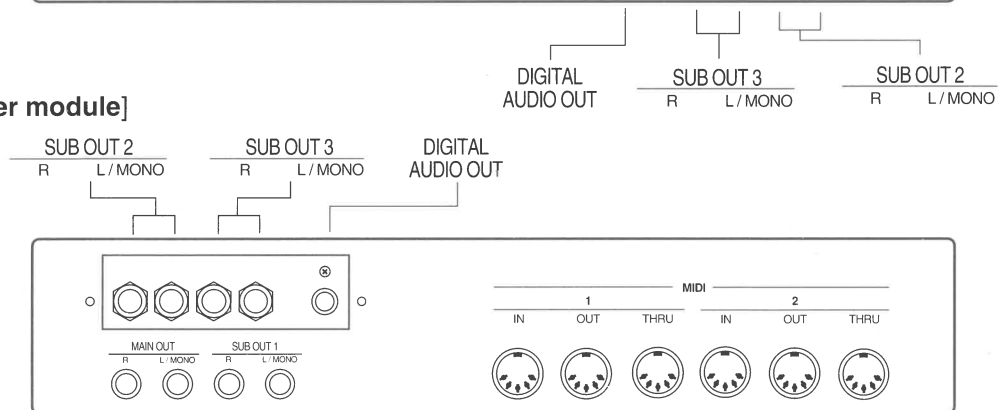
CONNECTIONS	1
DISASSEMBLY INSTRUCTIONS	2
P. C. Diagram	3
P. C. Board	4
REPLACEMENT PARTS LIST/P. C. Board	5
CABINET PARTS LOCATION	6
REPLACEMENT PARTS LIST/CABINET PARTS LIST	6
REPLACEMENT PARTS LIST/PACKING	7

CONNECTIONS

[Synthesizer]



[Synthesizer module]



SUB OUT 2, SUB OUT 3 (Output level 1.5 Vrms. 600 Ω)

These terminals are for sub output. To output monaural signals, connect the external equipment to the **L/MONO** terminal. (Do not connect the **R** terminal.)

DIGITAL AUDIO OUT (S/P DIF standard)

The stereo signals from the main output are output as digital signals through one connector.

Connect DAT equipment, for example, to this terminal.

Sampling frequency: 44.1 kHz

Number of quantizing bits: 20 bits linear

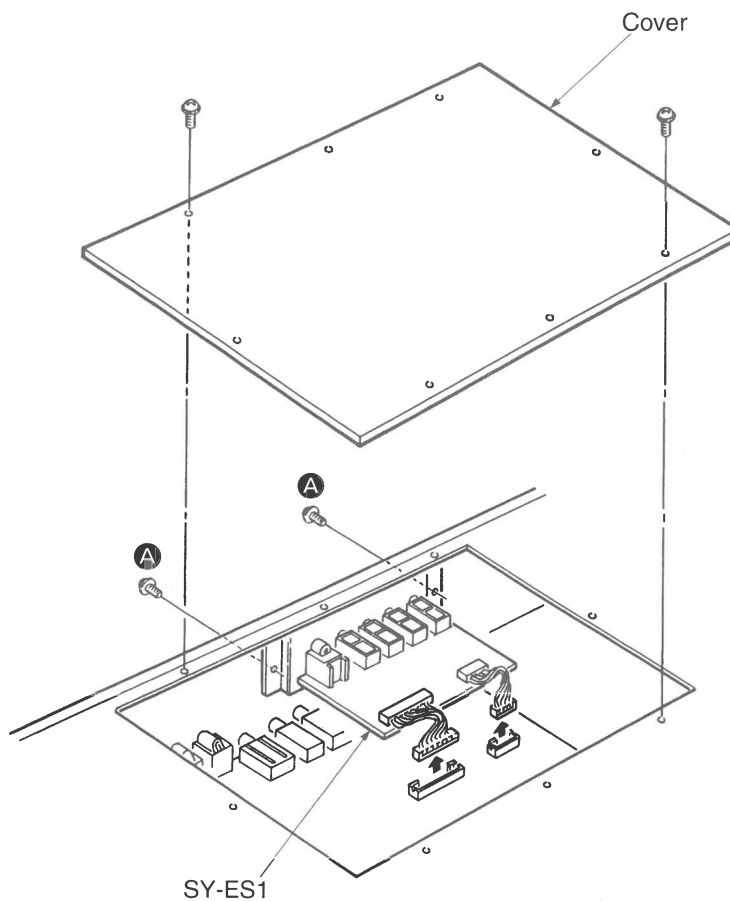
Channels: 2 channels (stereo)

Connector: RCA pin jack

DISASSEMBLY INSTRUCTIONS

1 Removing SY-ES1 (Output Expansion Board) from MAIN P.C.B.

1. Remove the cover from the bottom (synthesizer)/top (synthesizer module) of the main unit.
2. Remove the SY-ES1 holding screws (A 2 pcs.).



[Fig. 1]

P. C. Diagram

F

E

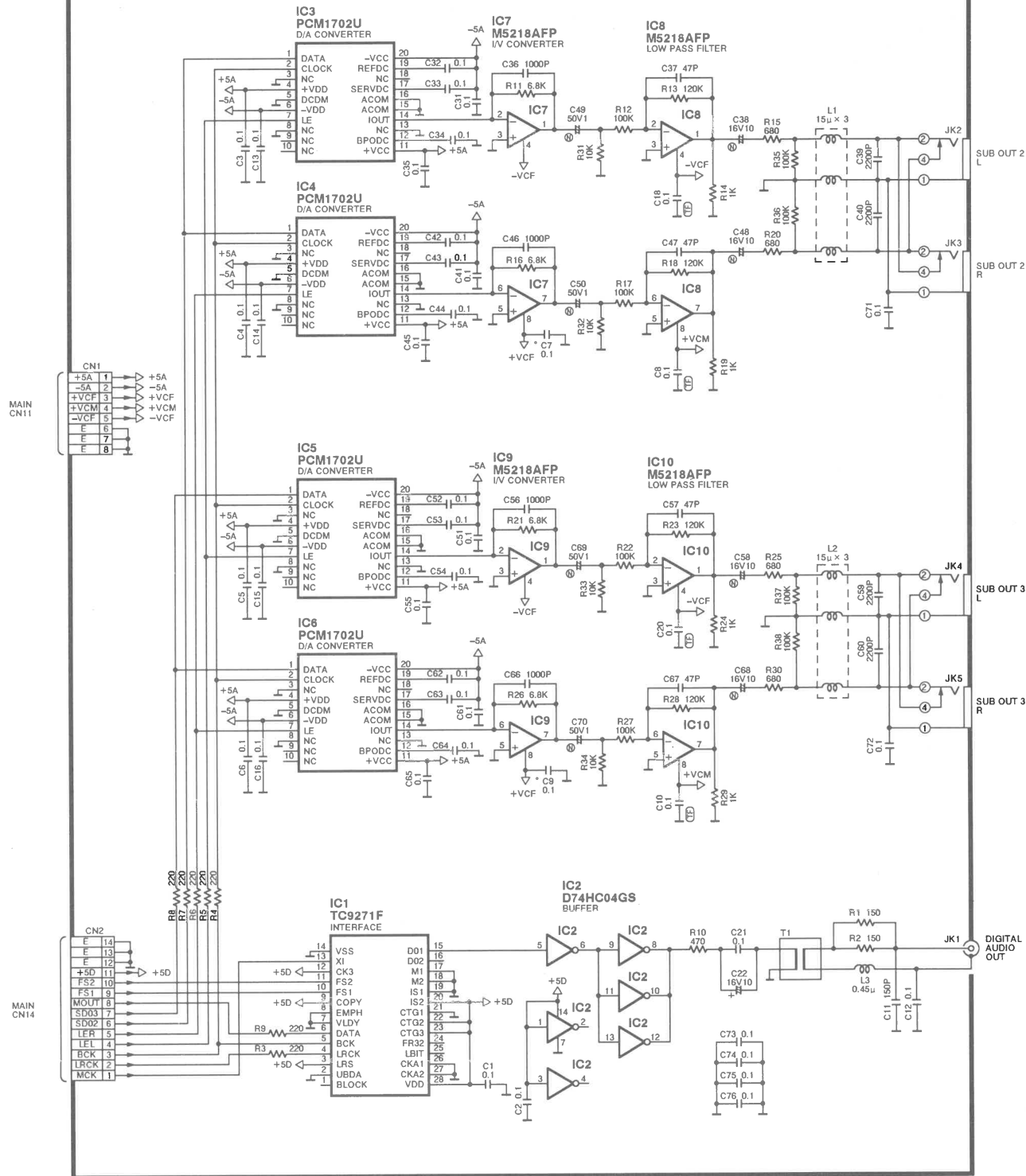
D

C

B

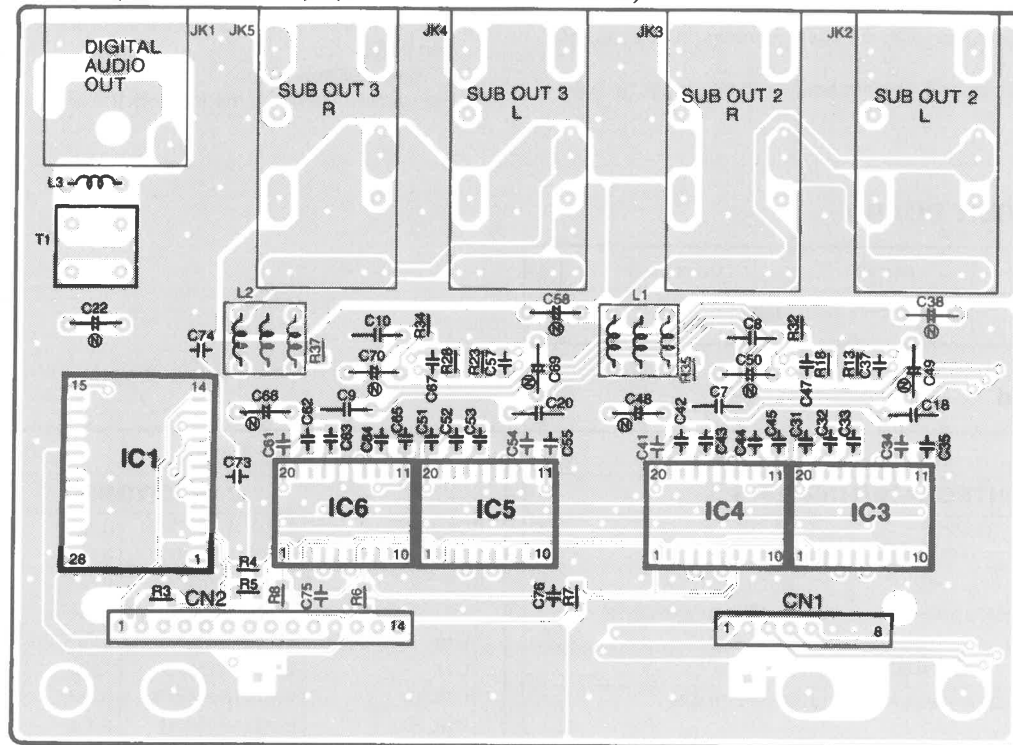
A

EXA

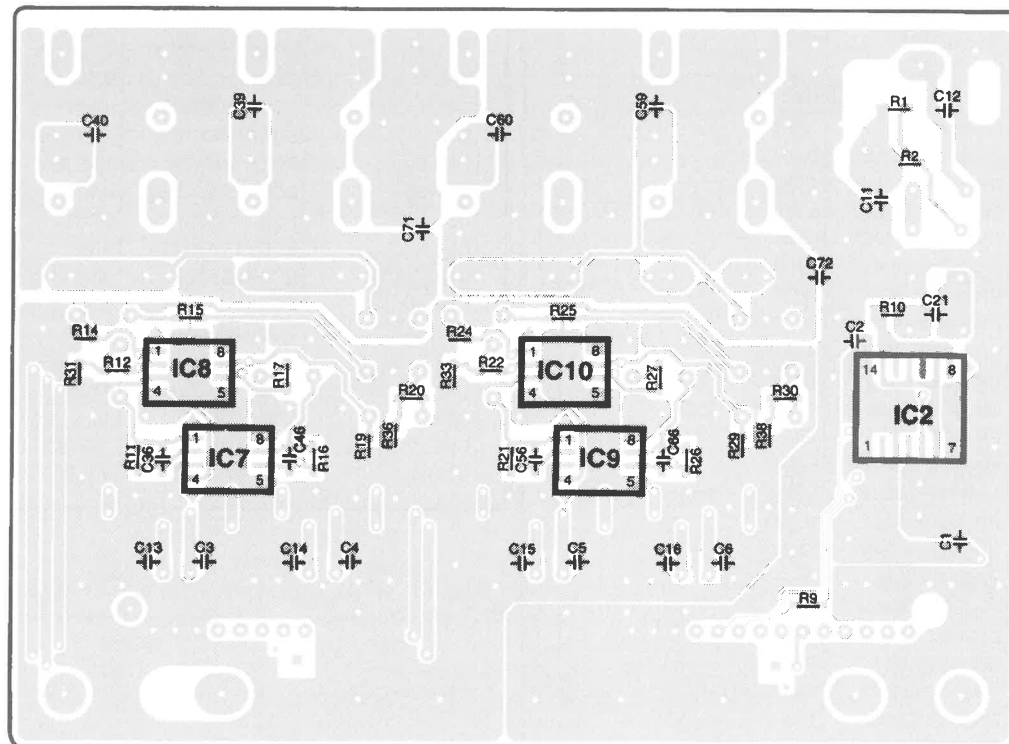


P. C. Board

EXA (SXPG223411) (COMPONENT SIDE)



EXA (FOIL SIDE)



REPLACEMENT PARTS LIST/ P. C. Board

Notes:

1. The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention.
After the end of this period, the assembly will no longer be available.

2. Important safety notice

Components identified by \triangle mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

3. The "S" mark is service standard parts and may differ from production parts.
4. \bigcirc mark are new parts.
5. For part No. with area mark, check the area when placing an order.

PRINTED CIRCUIT BOARD

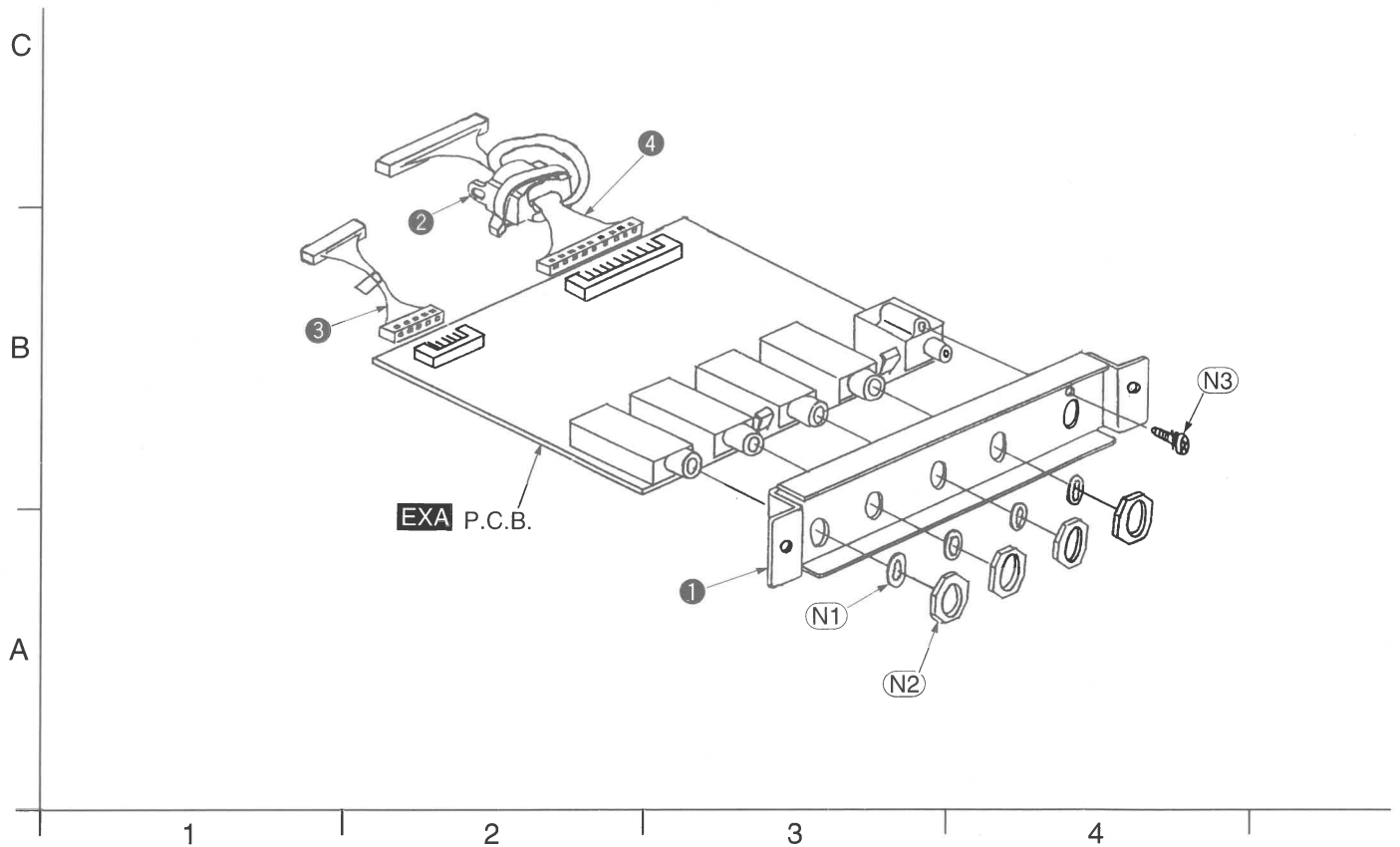
	RTL	Area	Part No.	Description	P/S
\bigcirc	RTL		SXPG223411	EXA	1

EXA P. C. Board

Ref. No.	Part No.	Description	P/S
INTEGRATED CIRCUITS			
\bigcirc IC1	TC9271F	IC, LOGIC	1
IC2	D74HC04GS	6 INVERTER	1
IC3-6	PCM1702U	D-A CONVERTER	4
IC7-10	M5218AFP	OPERATIONAL AMPLIFIER	4
TRANSFORMER			
\bigcirc T1	QTDG004AA	TRANSFORMER	1
COILS			
L1, 2	QLQGT3T150SA	15 μ H \times 3	2
L3	QLBG002A	0.45 μ H	1
JACKS			
\bigcirc JK1	QJSG015AA	JACK SOCKET	1
JK2-5	QJJG003AA	JACK	4
RESISTORS			
R1, 2	ERJ6GEYJ151V	150 Ω	2
R3-9	ERJ6GEYJ221V	220 Ω	7
R10	ERJ6GEYJ471V	470 Ω	1
R11	ERJ6GEYJ682V	6.8k Ω	1
R12	ERJ6GEYJ104V	100k Ω	1
R13	ERJ6GEYJ124V	120k Ω	1
R14	ERJ6GEYJ102V	1k Ω	1
R15	ERJ6GEYJ681V	680 Ω	1
R16	ERJ6GEYJ682V	6.8k Ω	1
R17	ERJ6GEYJ104V	100k Ω	1
R18	ERJ6GEYJ124V	120k Ω	1
R19	ERJ6GEYJ102V	1k Ω	1
R20	ERJ6GEYJ681V	680 Ω	1
R21	ERJ6GEYJ682V	6.8k Ω	1
R22	ERJ6GEYJ104V	100k Ω	1
R23	ERJ6GEYJ124V	120k Ω	1
R24	ERJ6GEYJ102V	1k Ω	1
R25	ERJ6GEYJ681V	680 Ω	1
R26	ERJ6GEYJ682V	6.8k Ω	1
R27	ERJ6GEYJ104V	100k Ω	1
R28	ERJ6GEYJ124V	120k Ω	1
R29	ERJ6GEYJ102V	1k Ω	1
R30	ERJ6GEYJ681V	680 Ω	1
R31-34	ERJ6GEYJ103V	10k Ω	4
R35-38	ERJ6GEYJ104V	100k Ω	4

Ref. No.	Part No.	Description	P/S
CAPACITORS			
C1-6	ECUV1H104ZFX	0.1 μ F	6
C7	ECRF1H104ZF	0.1 μ F	1
C8	ECQV1H104JM	0.1 μ F	1
C9	ECRF1H104ZF	0.1 μ F	1
C10	ECQV1H104JM	0.1 μ F	1
C11	ECUV1H151JG	150pF	1
C12-16	ECUV1H104ZFX	0.1 μ F	5
C18, 20	ECQV1H104JM	0.1 μ F	2
C21	ECUV1H104ZFX	0.1 μ F	1
C22	ECEA1CKN100	10 μ F, 16V	1
C31-35	ECUV1H104ZFX	0.1 μ F	5
C36	ECUV1H102JX	0.001 μ F	1
C37	ECUV1H470JG	47pF	1
C38	ECEA1CKN100	10 μ F, 16V	1
C39, 40	ECUV1H222KX	0.0022 μ F	2
C41-45	ECUV1H104ZFX	0.1 μ F	5
C46	ECUV1H102JX	0.001 μ F	1
C47	ECUV1H470JG	47pF	1
C48	ECEA1CKN100	10 μ F, 16V	1
C49, 50	ECEA1HKN010	1 μ F, 50V	2
C51-55	ECUV1H104ZFX	0.1 μ F	5
C56	ECUV1H102JX	0.001 μ F	1
C57	ECUV1H470JG	47pF	1
C58	ECEA1CKN100	10 μ F, 16V	1
C59, 60	ECUV1H222KX	0.0022 μ F	2
C61-65	ECUV1H104ZFX	0.1 μ F	5
C66	ECUV1H102JX	0.001 μ F	1
C67	ECUV1H470JG	47pF	1
C68	ECEA1CKN100	10 μ F, 16V	1
C69, 70	ECEA1HKN010	1 μ F, 50V	2
C71-76	ECUV1H104ZFX	0.1 μ F	6

CABINET PARTS LOCATION



REPLACEMENT PARTS LIST/CABINET PARTS LIST

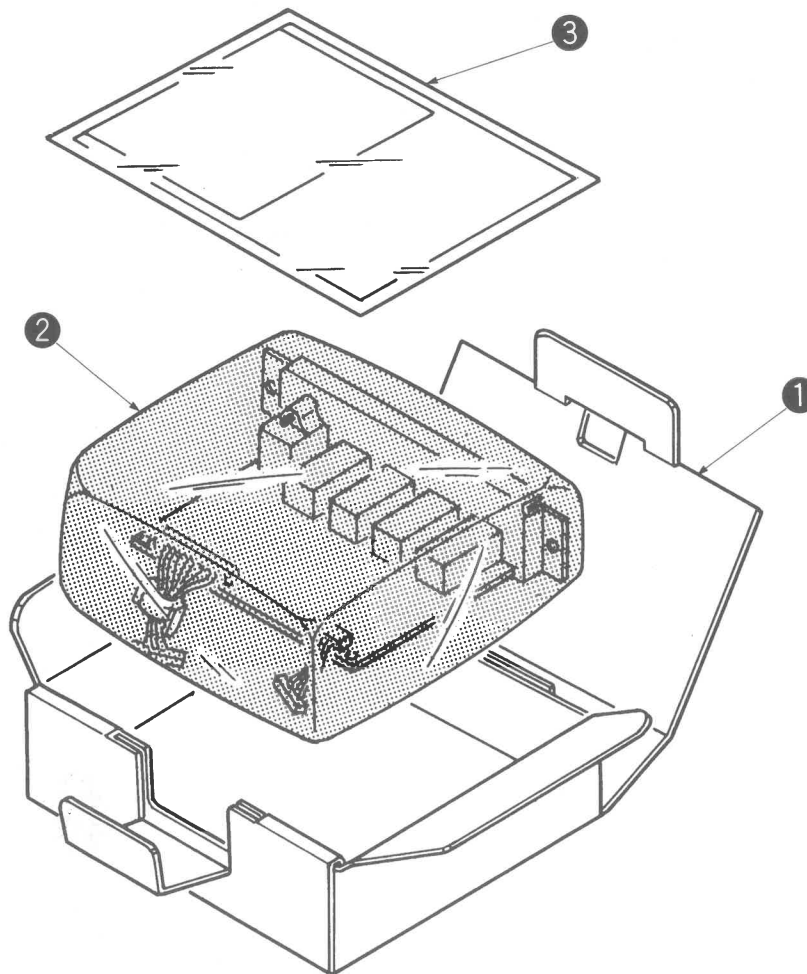
Notes:

1. The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention.
After the end of this period, the assembly will no longer be available.
2. ○ mark are new parts.
3. Important safety notice
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
4. For part No. with area mark, check the area when placing an order.
5. The raw material indication for synthetic resin
In order to facilitate classification of parts of synthetic resin manufacture and to promote the recycling of natural resources, a raw material symbol for such parts is indicated in the Ref. No./Material column.

■ CABINET PARTS

Ref. No.	Part No.	Description	P/S
CABINET PARTS			
○ 1	QGKG0124AA	PANEL	1
2	⚠ QLZG005A	CORE	1
○ 3	⚠ QEXGSS08006A	COMMU CABLE W/OUT PLUG	1
4	⚠ QEXGSS14015A	CONNECTOR WITH WIRE	1
SCREW & WASHER			
○ N1	QHWG012AA	WASHER	4
N2	XNS12FZ	NUT	4
○ N3	XYA3 + DJ14FZ	SCREW W/WASHER	1

REPLACEMENT PARTS LIST/PACKING



PACKING PARTS

Ref. No.	Part No.	Description	P/S
PACKING PARTS			
○ 1	QPKG001AA	PACKING CASE, PAPER	1
○ 2	PE QPFG039AA	POLYETHYLENE BAG	1
OPERATING INSTRUCTION MANUAL			
○ 3	QQFGES1AA	OPERATING INSTRUCTION MANUAL, <div style="display: flex; flex-wrap: wrap; gap: 2px;"> <div style="border: 1px solid black; padding: 1px;">EN</div> <div style="border: 1px solid black; padding: 1px;">MC</div> <div style="border: 1px solid black; padding: 1px;">EP</div> <div style="border: 1px solid black; padding: 1px;">EW</div> <div style="border: 1px solid black; padding: 1px;">EF</div> <div style="border: 1px solid black; padding: 1px;">EA</div> <div style="border: 1px solid black; padding: 1px;">EH</div> <div style="border: 1px solid black; padding: 1px;">X</div> <div style="border: 1px solid black; padding: 1px;">XL</div> <div style="border: 1px solid black; padding: 1px;">XS</div> <div style="border: 1px solid black; padding: 1px;">XM</div> <div style="border: 1px solid black; padding: 1px;">XD</div> <div style="border: 1px solid black; padding: 1px;">XT</div> <div style="border: 1px solid black; padding: 1px;">XP</div> <div style="border: 1px solid black; padding: 1px;">EK</div> <div style="border: 1px solid black; padding: 1px;">XR</div> <div style="border: 1px solid black; padding: 1px;">EZ</div> </div>	1
○ 3	QQFGES1BA	OPERATING INSTRUCTION MANUAL, <div style="border: 1px solid black; padding: 1px;">M</div>	1